

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

Conditional Major Draft Permit No. F-01-033

AUDUBON METALS, LLC

HENDERSON, KENTUCKY

SEPTEMBER 28, 2001

SIEW NONG LIM, REVIEWER

Plant I.D. #21-101-00118

Application Log #G368/51155

**SOURCE DESCRIPTION:**

Audubon Metals, LLC (hereby referred to as Audubon) receives non-ferrous metals from automobile shredding plant and produces high quality aluminum ingots for use in the automotive die-casting industry. The metal is a mixture of aluminum, zinc, copper, magnesium, and stainless steel. The material passes through five separation stations and is separated into steel, aluminum/magnesium mix, heavies, and high-quality aluminum categories. The high quality aluminum is then melted down in a smelter/converter furnace and cast into aluminum ingots.

The application requested an additional smelter/converter furnace as a standby in the event that either furnace #1 or #2 is down.

**COMMENTS:**

Originally, the application was received as a minor revision to Audubon's state origin permit S-98-094. However, the Division had determined that the construction of the standby furnace needs to be federally-enforceable to ensure that only 2 furnaces will be operated at any given time because Audubon had failed to prove that it is unable to operate all 3 furnaces at once. This was the main obstacle in the delayed issuance of this permit.

Since the new furnace is a standby unit and not more than 2 furnaces will be operated at any time, the net increase in the potential emission is zero. However, changes have been made to correct the existing plant total emissions. The PTE calculation errors in the previous review have been corrected as follow:

1. The existing HF emission factor of 2.85884 lbs/ton flux was corrected to reflect the amount of fluorides in the fluxing agent used. From the MSDS of the flux salt, a maximum of 6% is fluoride. The worst-case emission factor of 100 lbs particulate/ton flux is used as the basis. The resulting HF emission factor of 6 lbs/ton flux or 0.227 lb/ton aluminum is more conservative.
2. The MSDS of the fluxing agent shows presence of mineral oil. This suggests the emission of VOC, which was not accounted for in the previous review. The resulting VOC emission factor is 8 lbs/ton flux or 0.303 lb/ton aluminum.
3. The VOC and Cl compounds in the furnace results in dioxins and furans (D/F) emissions, which are subject to the area source requirements of the Secondary Aluminum MACT. Therefore, pollutant D/F is included in the existing PTE.
4. The chlorine and HCl emission factors of about 1000 lbs/ton is too high. From SCC 3-04-001-04 (fluxing/chlorination), this 1000 lbs/ton emission factor is for worst-case particulate emissions. Since the furnace pump ensures a chlorine utilization rate of 96%, the chlorine and HCl emission factor is  $(1-96/100) * 1000 \text{ lbs/ton} = 40 \text{ lbs/ton chlorine or } 0.145 \text{ lb/ton aluminum}$ .

5. In the previous review, control efficiency of the in-line lime injection was erroneously taken to be 99%, which is the particulate control efficiency of the baghouse. This may have been due to the assumption that the in-line dry lime injection is the lime injection in the baghouse. The current application and confirmation with the company's consultant (Mr. G. Trivedi) both indicate that the lime injection and the baghouse are separate units. The lime injection/dry scrubber has a control efficiency of 60%. Therefore, the control of the acid gases is only 60% instead of 99%.
6. Since control efficiency of the acid gases was reduced, the resulting emissions would increase. The source-wide emission of HF (4.39 TPY) was remodeled with ISCST3. The resulting ground level concentration is still below the 24-hour-average secondary ambient air quality standard of 2.86  $\mu\text{g}/\text{m}^3$ , which was applied in previous review.
7. Dross skimming of the furnaces is performed once every 8-hour shift and it lasts for about half an hour. Since Audubon is one of the 28 source categories, emissions from dross skimming is included as fugitive in this revision.
8. An existing emission point, the rotary dryer, was not included in the previous review. The rotary dryer uses heat to dry water, oil, and water/oil mixture off the aluminum scrap (source of VOC and D/F emissions). Emissions from this process are significant enough for the source to install an afterburner and a lime injection/dry scrubber-baghouse for the dryer. In addition, this emission point is defined as a thermal chip dryer, which is subject to area source requirements of the Secondary Aluminum MACT. Consequently, emissions from this point should be included in the existing plant PTE.
9. Fugitive dust emissions from vehicular traffic on the unpaved and paved roads, which were previously determined in reviews prior to S-98-094, were excluded in S-98-064. In this review, those emissions will be included to the existing PTE.

This permit is a conditional major for particulate. The permittee is required to test for particulate, visible, and D/F emissions. The following summarizes the applicable regulations:

- 401 KAR 52:030 – Federally-enforceable permits for non-major sources. Applies to source-wide particulate emissions.
- 401 KAR 53:010 – Ambient air quality standards. Applies to HF emissions.
- 401 KAR 59:010 – New process operations. Applies to particulate and visible emissions from all emission activities except for fuel usage and fugitive loss.
- 401 KAR 63:010 – Fugitive emissions. Applies to fugitive emissions.
- 401 KAR 63:020 – Potentially hazardous matter or toxic substances. Applies to  $\text{Cl}_2$  and HCl emissions.
- 40 CFR 63 Subpart RRR – National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production. Applies to D/F emissions from each group 1 furnace, SAPU, and thermal chip dryer.

**EMISSION AND OPERATING CAPS DESCRIPTION:**

Emission caps are as follow:

Emission Point	Pollutant	Allowable	Applicable Regulation
<p>Group 1:</p> <ul style="list-style-type: none"> <li>• 003(E2-1, E2-2) Smelter/Converter Furnace #1</li> <li>• 004(E2-3, E2-4) Smelter/Converter Furnace #2</li> <li>• 005(E2-5, E2-6) Smelter/Converter Furnace #3</li> <li>• Secondary Aluminum Processing Unit (SAPU): 003(E2-1, E2-2) and 004(E2-3, E2-4), or 003(E2-1, E2-2) and 005(E2-5, E2-6), or 004(E2-3, E2-4) and 005(E2-5, E2-6)</li> <li>• 006(-) Rotary Dryer</li> </ul>	<ul style="list-style-type: none"> <li>• Particulate / Opacity</li> <li>• HF</li> <li>• D/F (TEQ)</li> </ul>	<p><u>Particulate/Opacity:</u></p> <ul style="list-style-type: none"> <li>• Source-wide particulate emissions shall not exceed 98.5 tons/12-month rolling average. Self-imposed to preclude 401 KAR 52:020 – Title V permits.</li> <li>• For each furnace, particulate emission allowable is 6.16 pounds/hour, 27 tons/12-month rolling average. For the dryer, particulate emission allowable is 5.02 pounds/hour, 22 tons/12-month rolling average.</li> <li>• For each emission point, the opacity shall not equal or exceed 20%.</li> </ul> <p><u>HF:</u></p> <ul style="list-style-type: none"> <li>• Source-wide HF emissions shall not exceed 4.39 tons/12-month rolling average.</li> </ul> <p><u>D/F:</u></p> <ul style="list-style-type: none"> <li>• D/F emissions shall not exceed the limits specified in the applicable regulations for each group 1 furnace, thermal chip dryer, and SAPU.</li> </ul>	<p><u>Particulate/Opacity:</u></p> <ul style="list-style-type: none"> <li>• 401 KAR 52:030 - Self-imposed to preclude 401 KAR 52:020.</li> <li>• 401 KAR 59:010</li> </ul> <p><u>HF:</u> 401 KAR 53:010</p> <p><u>D/F:</u> 40 CFR 63 Subpart RRR §63.1505 (c)(2), (i)(3), and (k)(3)</p>
<p>Group 2:</p> <ul style="list-style-type: none"> <li>• 001(E0) Raw material handling – non-ferrous metal scrap</li> <li>• 002(E1) Ring crusher and air classifier</li> <li>• 007(-) Vehicular Traffic Fugitive</li> </ul>	<p>Particulate / Opacity</p>	<ul style="list-style-type: none"> <li>• Particulate emission allowable is 1.14 pounds/hour, 5 tons/12-month rolling average for 001(E0), 0.34 pounds/hour, 1.5 tons/12-month rolling average for 002(E1), and 3.65 pounds/hour, 5 tons/12-month rolling average for 007(-).</li> <li>• For 007(-), the opacity shall not equal or exceed 20%.</li> </ul>	<ul style="list-style-type: none"> <li>• 401 KAR 52:030 - Self-imposed to preclude 401 KAR 52:020.</li> <li>• 401 KAR 59:010</li> </ul>

Operating caps are as follow:

Emission Point	Pollutant	Operating requirement	Applicable Regulation
<p>Group 1:</p> <ul style="list-style-type: none"> <li>• 003(E2-1, E2-2) Smelter/Converter Furnace #1</li> <li>• 004(E2-3, E2-4) Smelter/Converter Furnace #2</li> <li>• 005(E2-5, E2-6) Smelter/Converter Furnace #3</li> <li>• Secondary Aluminum Processing Unit (SAPU): 003(E2-1, E2-2) and 004(E2-3, E2-4), or 003(E2-1, E2-2) and 005(E2-5, E2-6), or 004(E2-3, E2-4) and 005(E2-5, E2-6)</li> <li>• 006(-) Rotary Dryer</li> </ul> <p>Group 2:</p> <ul style="list-style-type: none"> <li>• 001(E0) Raw material handling – non-ferrous metal scrap</li> <li>• 002(E1) Ring crusher and air classifier</li> </ul> <p>007(-) Vehicular Traffic Fugitive</p>	<ul style="list-style-type: none"> <li>• Particulate</li> <li>• HAPs</li> <li>• D/F (TEQ)</li> </ul>	<p><u>Particulate:</u></p> <ul style="list-style-type: none"> <li>• The permittee shall not operate more than 2 furnaces at any given time. Self-imposed to preclude 401 KAR 52:020 – Title V permits.</li> <li>• For each furnace, the permittee shall not process more than 5.5 ton/hour of scrap aluminum and base metal, 10,000 pounds/day of flux, and 40 pounds/hour of demag chlorine gas charge flux salt. For the dryer, the permittee shall not process more than 9.74 tons/hour of scrap aluminum. The permittee shall not process at rates that will cause source-wide particulate emissions to exceed 98.5 tons/12-month rolling average. Self-imposed to preclude 401 KAR 52:020 – Title V permits.</li> <li>• The permittee shall comply with applicable operating standards in 401 KAR 63:010 Section 3.</li> </ul> <p><u>HAPs:</u> The permittee shall comply with operating standard in 401 KAR 63:020 Section 3.</p> <p><u>D/F:</u></p> <ul style="list-style-type: none"> <li>• The permittee shall comply with applicable operating requirements specified in the applicable regulation for each group 1 furnace, thermal chip dryer, and SAPU.</li> </ul>	<p><u>Particulate:</u></p> <ul style="list-style-type: none"> <li>• 401 KAR 52:030 - Self-imposed to preclude 401 KAR 52:020.</li> <li>• 401 KAR 63:010</li> </ul> <p><u>HAPs:</u> 401 KAR 63:020</p> <p><u>D/F:</u></p> <ul style="list-style-type: none"> <li>• 40 CFR 63 Subpart RRR §63.1506</li> </ul>

**PERIODIC MONITORING:**

Periodic monitoring requirements are as follow:

- i. The type and monthly amount of scrap aluminum processed.
- ii. Perform a qualitative visual observation of the opacity of emissions from each stack or vent on a monthly basis and maintain a log of the observation
- iii. The monthly total vehicles miles traveled for paved and unpaved roads.
- iv. The monthly hours of operation of each emission point.
- v. The applicable periodic monitoring requirements in 40 CFR 63 Subpart RRR §63.1510, which include furnace, dryer, flux, lime, and baghouse monitoring.

**OPERATIONAL FLEXIBILITY:**

Alternate Operating Scenarios:

- Scenario 1: Smelter/Converter Furnace #1 and Smelter/Converter Furnace #2 operating simultaneously with the following control scenario:
- E2-1 and E2-3 exhausting through the dry scrubber/baghouse and
  - E2-2 and E2-4 exhausting through the afterburner and dry scrubber/baghouse via the rotary dryer or E2-2 and E2-4 exhausting uncontrolled to the atmosphere when auxiliary natural gas is utilized in rotary dryer.
- Scenario 2: Smelter/Converter Furnace #1 and Smelter/Converter Furnace #3 operating simultaneously with the following control scenario:
- E2-1 and E2-5 exhausting through the dry scrubber/baghouse,
  - E2-2 exhausting through afterburner and dry scrubber/baghouse via the rotary dryer or E2-2 exhausting uncontrolled to the atmosphere when auxiliary natural gas is utilized in rotary dryer.
  - E2-6 exhausting uncontrolled to the atmosphere.
- Scenario 3: Smelter/Converter Furnace #2 and Smelter/Converter Furnace #3 operating simultaneously with the following control scenario:
- E2-3 and E2-5 exhausting through the dry scrubber/baghouse,
  - E2-4 exhausting through afterburner and dry scrubber/baghouse via the rotary dryer or E2-4 exhausting uncontrolled to the atmosphere when auxiliary natural gas is utilized in rotary dryer.
  - E2-6 exhausting uncontrolled to the atmosphere.

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.